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1. A computer implemented method of calculating an outer diameter of a wire packing which is formed by bundling and packing a plurality of wires into a smallest possible circular shape so as not to overlap each other, the method comprising:

an including-circle assuming step of assuming an including circle which includes a plurality of circles arranged in a plane so as not to over lap each other by assuming that cross-sectional shapes of the plurality of wires are the plurality of circles having diameters corresponding to respective outer shapes thereof;

a target-circle defining step of determining a target circle which has the same center as that of the including circle and is slightly smaller than the including circle, and from which at least one of the plurality of circles protrudes;

a searching step of setting the circle protruding from the target circle as insertion trial circle, and searching positions to which the plurality of circles other than the insertion trial circle can be moved as distantly as possible within the target circle without overlapping each other; and

an inserting step of inserting the insertion trial circle in a space in the target circle created by changing a layout of the plurality of circles on the basis of a result of search in the searching step,

wherein, if the insertion trial circle is successfully inserted in the space in the target circle during the inserting step, the method further comprises:

a first search controlling step of setting a new target circle which is slightly smaller than the target circle, wherein at least one of the plurality of circles protrudes from the new target circle;

setting the new target circle as the target circle; and

returning to and executing the searching step, and

wherein, if the insertion trial circle is not successfully inserted in the space in the target circle during the inserting step, the method further comprises outputting at least the outside diameter of the including circle.

2. The computer implemented method according to claim 1, wherein, in the searching step, a circle Voronoi diagram is constructed by a circle set excluding the insertion trial circle and one of the plurality of circles, and the target circle, and an examination is made with respect to the plurality of circles other than the insertion trial circle as to whether or not a center of the one circle tangent to both side circles forming each of boundary edges in the circle Voronoi diagram is located on the boundary edge, to thereby search positions to which the circles can be moved within the target circle.

3. The computer implemented method according to claim 1 further comprising:

a second search controlling step of determining a new target circle which is of an intermediate size between the including circle and the target circle if the insertion trial circle is not successfully inserted in the space in the target circle during the inserting step, and executing the searching step and the inserting step while setting the new target circle as the target circle.

4. An apparatus for calculating an outside diameter of a wire packing which is formed by bundling and packing a plurality of wires into the smallest possible circular shape so as not to overlap each other, the apparatus comprising:

input means for inputting initial information concerning the plurality of wires,

including-circle assuming means for assuming an including circle which includes a plurality of circles arranged in a plane so as not to overlap each other by assuming that cross-sectional shapes of the plurality of wires are the plurality of circles having diameters corresponding to respective outer shapes thereof;

target-circle defining means for determining a target circle which has the same center as that of the including circle and is slightly smaller than the including circle, and from which at least one of the plurality of circles protrudes;

searching means in which the circle protruding from the target circle is set as an insertion trial circle, and positions are searched to which the plurality of circles other than the insertion trial circle can be moved as distantly as possible within the target circle without overlapping each other;

inserting means for inserting the insertion trial circle in a space in the target circle created by changing the layout of the plurality of circles on the basis of a result of search by the searching means; and

wherein, in a case where the insertion trial circle is successfully inserted in the target circle, the apparatus further comprises:

first search controlling means in which a new target circle which is slightly smaller than the target circle is set, wherein at least one of the plurality of circles protrudes from the new target circle, wherein the new target circle is set as the target circle, and wherein control is returned to the searching means which executes the search, and

wherein, in a case where the insertion trial circle is not successfully inserted in the target circle, the apparatus further comprises output means for outputting at least the outside diameter of the including circle.

5. The apparatus according to claim 4, wherein the output means outputs position information on the including circle and the plurality of circles.

6. The apparatus according to claim 4 or 5, wherein the searching means includes second searching means in which a circle Voronoi diagram is constructed by a circle set excluding the insertion trial circle and one of the plurality of circles, and the target circle, and in which an examination is made with respect to the plurality of circles other than the insertion trial circle as to whether or not a center of the one circle tangent to both side circles forming each of boundary edges in the circle Voronoi diagram is located on the boundary edge, to thereby search positions to which the circles can be moved within the target circle.

7. The apparatus according to claim 4, further comprising: second search controlling means which, in a case where the insertion trial circle is not successfully inserted in the target circle, determines a new target circle which is of an intermediate size between the including circle and the target circle and the search by the searching means is effected while setting the new target circle as the target circle.

8. A computer readable recording medium storing computer executable instructions for executing a method for calculating an outside diameter of a wire packing which is formed by

bundling and packing a plurality of wires into the smallest possible circular shape so as not to overlap each other, said method comprising:

an input step of inputting initial information concerning the plurality of wires,

an including-circle assuming step of assuming an including circle which includes a plurality of circles arranged in a plane so as not to overlap each other by assuming that cross-sectional shapes of the plurality of wires are the plurality of circles having diameters corresponding to respective outer shapes thereof;

a target-circle defining step of determining a target circle which has the same center as that of the including circle and is slightly smaller than the including circle, and from which at least one of the plurality of circles protrudes;

a searching step in which the circle protruding from the target circle is set as an insertion trial circle, and positions are searched to which the plurality of circles other than the insertion trial circle can be moved as distantly as possible within the target circle without overlapping each other;

an inserting step of inserting the insertion trial circle in a space in the target circle created by changing the layout of the plurality of circles on the basis of a result of search by the searching means; and

wherein, in a case where the insertion trial circle is successfully inserted in the target circle in the inserting step, the method further comprises:

a first search controlling step in which a new target circle which is slightly smaller than the target circle is set, wherein at least one of the plurality of circles protrudes from the new target circle;

setting the new target circle as the target circle; and

returning and executing the searching step,

wherein, in a case where the insertion trial circle is not successfully inserted in the target circle, the method further comprises an output step of outputting at least the outside diameter of the including circle.